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JULY 1986

Combat Crew

strategic air command

FORTY & FORWARD

STRATEGIC AIR COMMAND

DETERRENCE: THE SAC CREW MEMBER'S LEGACY

Lieutenant General Monroe W. Hatch
Vice Commander in Chief
Strategic Air Command

July 4, 1776: a momentous occasion . . . the declaration in Philadelphia of the birth of a new nation, conceived in battle, with an unsurpassed vision for the future. Later, when the long trial by fire was over and victory won, the leaders of the struggle met again to draft a governing document for the fledgling nation. When the task was completed and the delegates were leaving, a passerby asked, "What kind of government have you given us?" "We have given you a republic," answered Benjamin Franklin, ". . . if you can keep it."

We have managed to keep it for more than 200 years. For the men and women of Strategic Air Command, keeping the republic safe and free is a 24 hour a day, 7 day a week, 365 day a year effort. It is our daily task; it is our profession.

We keep it safe and free by deterring nuclear conflict. Deterrence has some unique aspects: we always know whether we are accomplishing our mission—we are successful when the nation is at peace. Successful deterrence involves an effective combination of capability, will, and perception. We must have the **capability,** in personnel and equipment, to defend our system of values, our freedoms, and our way of life. We must have the **will,** both individually and as a nation, to meet the challenges facing us. Finally, potential enemies must **perceive** that we have the ability and the resolve necessary to make the cost of aggression unacceptable; that we have the will and the capability to achieve our national objectives.

The three factors which create deterrence are characteristically addressed in a national context. But, a major part of the foundation upon which they rely is the Combat Crew Force of Strategic Air Command.

We achieve deterrence by setting and attaining the highest standards of crew proficiency; by ensuring that our training programs are realistic, responsive, and thorough; by insisting that our evaluations are tough but fair; by assuring that our Emergency War Order mission receives paramount priority; and by providing for the well-being of our people and the security of our equipment and facilities.

High standards of professional competence demonstrate the will to deter. A commitment to excellence, pride in the unit, and personal courage, character, and competence are essential ingredients in sustaining the capabilities necessary to our success. Without them we cannot succeed; with them we can surmount any challenge.

High standards help us achieve the capability and will to deter conflict, but their ultimate value—and the final measure of their success—is the perception they create in the mind of a potential aggressor. Our adversaries must be convinced that we have the ability **and** resolve necessary to make aggression too costly to pursue.

We have kept the republic that was promised us those many years ago. But keeping it is not easy nor without sacrifice. The giving of one's self to a profession which is held to the highest standards by the society which it serves requires continuing dedication and commitment; and of course, there is the unique nature of our calling—to protect a nation and preserve it for future generations. A difficult task; but there is none more important. By deterring conflict, SAC safeguards the ideals and promise of the marvelous document first read to a Philadelphia audience more than 200 years ago.

The Fourth of July celebrates where we have been, where we are, and what we can be as a nation. It provides an appropriate occasion for reflection and pride—because it is the daily, year around professionalism of SAC air crews and missileers that forms the foundation of the nation's security.

"We have given you a republic," said Franklin, ". . . if you can keep it." We intend to keep it. The courage, competence, and character of SAC crew members will assure that we do. ★ ★ ★

FLARE

Combat Crew

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COMBAT CREW is an internal publication of the Strategic Air Command with the primary purpose of promoting safety. The contents of this magazine are informative and not to be considered as directive in nature. Facts, testimony and conclusions of all mishaps printed herein may not be construed as incrimination under Article 31 of the Uniform Code of Military Justice. All names, dates and places used in conjunction with mishap stories are fictitious. Written permission must be obtained from Headquarters, Strategic Air Command before any material may be reprinted by other than U.S. Air Force organizations. Use of funds for printing this publication has been approved by Hq. USAF, Distribution FX, controlled by IGFF SAC units submit distribution requests through local PDO. Reader to copy ratio 10:1. For sale by the Superintendent of Documents. U.S. Government Printing Office, Washington, D.C. 20402.

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ON OUR COVER

"Combat Crew" helps America celebrate 210 years of independence with its Fourth of July issue. See page 4 and back cover for award winning essays by Capt Edward J. Manzano, Jr., 524 BMW, Wurtsmith AFB.

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FORTY & FORWARD

STRATEGIC AIR COMMAND

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WHAT PRICE FREEDOM?

Capt Edward J. Manzano, Jr.
524 BMW, Wurtsmith AFB

This article and the one printed on our back cover, also by Capt Manzano, have won awards presented by the Freedom Foundation, Valley Forge, PA, for excellence in military essays. Ed

As citizens of the United States of America, we live in a free and democratic society. As Americans, we have inherited a nation with a legacy second to none. The roots of our republic stem from the desire of our forefathers to live as free men with, as Jefferson said, the rights of "life, liberty and the pursuit of happiness." This freedom has been handed down from generation to generation, thanks to the sacrifices of millions of American lives, male and female, rich and poor, from every social, racial, and religious group in the United States. In war after bloody war, the preservation and continuation of the American way of life have been purchased at a fearful price.

As a citizen and a career military officer, I am proud of America. This does not imply perfection, for social injustice exists today in our society. However, it can also be stated that no country in history has done more to help the world than the United States. As a refuge for immigrants seeking freedom, America has always opened its arms. As the champion of human rights and dignity, no other society in the world today can equal ours where any person with an idea and determination can fashion a successful life. Despite the many wrongs committed against its citizens, what has separated our way of life from others is the unyielding commitment of the people to correct these injustices and give all citizens a voice which can be heard, whether they agree with the government or not. As a military officer, I must admit that I do not fully understand the voices of the many dissidents in our country. What I do understand, however, is that their voices must be heard, for the Constitution guarantees all citizens the right to protest, to peaceably assemble and to express their opinions when they feel their government is in error. And while we members of the military forces may not always understand or agree with the reasons behind such actions, let us never forget that it is our duty to protect the rights of all American citizens, regardless of their beliefs. We in the military have pledged ourselves to uphold the Constitution and all that it stands for. If that means listening to those with dissident viewpoints, so be it. They have the right to be heard. This is what separates the American way of life from tyranny. This is the price we pay for our freedom, like it nor not. In my opinion, it's worth it.

Making the Correct Decision

Maj Ed Pearce
4007 CCTS, FB-111A, CFIC

All too often, mishap reports list errors in judgment as causal factors in the accident. Air Force Inspection and Safety Center records reflect that 65% of the class A mishaps occurring in the 1984-1985 time frame were operations related. How many of those mishaps were caused by the pilot making the wrong decision at the wrong time? While sometimes difficult to determine, it appears certain that many judgment errors which lead to disaster can be avoided if an impending problem is recognized early. This article discusses the obstacles to early recognition and accurate analysis of problems as they relate to judgment. Let me begin by defining the somewhat elusive but absolutely essential quality which every supervisor and instructor looks for in estimating reliability and competence.

To me, judgment is the mental ability to accurately perceive and distinguish relationships and alternatives, and to make reasonable decisions. Flight crew judgment is the process of recognizing and analyzing all available information about oneself, the aircraft and the flying environment, and then implementing timely, safe decisions. The keys to a sound decision are one's attitude about risk-taking and ability to evaluate risks. Decisions are then made based upon knowledge, skill and experience. Each decision process involves a number of variables: a problem, an element of risk, a time constraint and personal factors.

In the inherently risky business of flying, the type of problem and the timing involved are often beyond the crew members' control. The variables over which an individual does have control are the personal factors, attitude and stress management. A crew member recognizing that a problem exists in one of these areas should be aware of the increased potential for making an incorrect decision. This increased awareness of the decision process by flyers and supervisors may be the key to timely intervention and accident prevention.

Flying is stressful. Crews experience pressure, real or perceived, in a number of ways:

"The pressure is on tonight to get that ICTS! If you don't, someone else will have to go on alert for you!"

"Okay, guys, we're here at Nellis for Red Flag. Let's not look like student pilots in our formation flying."

Then there is the alert and TDY cycles crews face in SAC. Separation

from one's family also creates a good deal of stress.

Psychologists believe that low levels of stress help the individual perform at optimum levels. A stressful situation may force an innovative solution to a problem, or may increase the strength and senses of the individual. They will also warn, however, that stress over a long period of time can be harmful, as a person may develop rigid behavior patterns to help cope. Some of these characteristics are called "hazardous thought patterns." The **Judgment Training Manual for Instructor Pilots,** produced jointly by the FAA, Transport Canada, and the General Aviation Manufacturers Association, identified these characteristics to help both instructor and student pilots improve flying safety by establishing good decision processes.

While reviewing Hazardous Thought Patterns, some of the characters may sound familiar:

- Anti-authority — "Don't tell me!" This is the guy who does not like anyone telling him what to do, from haircuts to regulations.

- Impulsiveness — "Do something and quickly!" This person feels the need to react immediately for fear that failure to do so will indicate incompetence. He fails to analyze his alternatives.

- Invulnerability — "It won't happen to me!" Many people feel accidents will happen to others, not themselves. Although they know accidents can happen, they never really feel or believe they will be involved. Pilots who feel this way are more likely to take chances and accept unwise risks.

- Macho — We've all run into this character. He's the best pilot he knows. He "proves" himself by taking risks and by trying to impress others. By the way, this characteristic is not only limited to males.

- Resignation — "What's the use?" This individual doesn't see himself as making a great deal of difference in the world around him. When things are going well, he's lucky; when things go wrong, someone's out to get him.

- In most cases, simply being aware of hazardous thoughts will help an individual avoid inflight judgmental errors. It is vitally important for instructors and supervisors to be able to detect problems and take positive steps to change dangerous attitudes.

Crews rely on training, systems knowledge and common sense to handle inflight problems effectively. Errors can be made if the stress level is too high. The Judgment Training Manual identifies the way poor decisions are carried out. Using the Action Ways to analyze a poor decision may help in discussing and correcting the problem.

> **"Okay guys, we're here at Nellis for Red Flag. Let's not look like student pilots in our formation flying."**

- Do — Did something that should not have been done.
- No Do — Failed to do something that should have been done.
- Over Do — Did too much to alleviate a problem.
- Under Do — Didn't do enough to alleviate the problem.
- Early Do — Acted too early.
- Late Do — Acted too late.

Poor Judgment Chain

A judgmental error results from any number of factors. Once a mistake is made, it is natural to feel obligated to live with it, even justify it by basing subsequent decisions on the first. This is the first link in the "poor judgment" or PJ chain. This cause and effect relationship is very apparent in many mishap reports. Once a PJ chain begins inflight, safe alternatives decrease rapidly.

The key to returning to a safe flying condition is breaking this PJ chain. This can be accomplished by admitting you've used poor judgment, then aggressively engaging in problem resolving. The crew member who consistently exercises good judgment inflight is engaged in at least two of the following three phases at all times: automatic reaction; problem resolving; and repeated reviewing.

Automatic reaction is used to maintain ongoing control of the aircraft and to respond to bold print type emergencies.

Problem resolving is the process used to overcome undesirable situations by means of a systematic process, as in working through a maze of section three checklists.

- Step 1: Uncover, analyze and define the problem.
- Step 2: Consider methods and possible outcomes of potential solutions.
- Step 3: Apply the selected solution.
- Step 4: Obtain feedback about how the solution is working.

Repeated reviewing keeps the crew member constantly aware of all the factors that are dynamic in his environment that could affect safety or mission accomplishment. This is the final step in both decision making and breaking the PJ chain.

Experience and Judgment

"You won't be selected to fly the ORI until you've flown one." There is no substitute for experience. The person who has experienced more problems in flight usually has more hours in the plane than anyone else. That individual has the background to make excellent decisions. He or she serves as the SOF and the duty IP. They've probably even written parts of the dash 1. How does a new crew member gain the wherewithal to make sound decisions? Remember, the keys to sound decisions are knowledge, skill and experience.

Know the regulations. An indepth knowledge of regulations that pertain to flying operations provide a firm background on which to base decisions. Most regulations were written at groundspeed zero, many as a result of an inflight error. Compliance with regulations not only earns good OER's, but may well save lives. What about bad regulations? They produce a dilemma. In general, bending one rule leads to bending another. Further, some individuals may be adversely influenced by an experienced crew member's disregard of a "bad reg." A professional attempts to comply with all regulations or takes the initiative to change them.

Know tech data. Like regulations, an indepth knowledge of tech data may provide an edge when it comes to making good inflight decisions. Knowing the warnings and cautions and maintaining an understanding about how the checklists work and what they are intended to do is tremendously important.

Learn from the mistakes of others. In lieu of 1000 hours in the plane and the experience time brings, learning from the mistakes and experiences of others can be an invaluable way to improve inflight decisions. This can be accomplished by reading mishap reports, participating in flying safety and instructor meetings and conducting hangar flying sessions. One type of meeting that should be discouraged however, is the one that occurs in the O'Club on Friday night. "Bar talk," the kind where macho individuals talk of their exploits in the air, can influence younger crew members to extend themselves beyond their capabilities.

Thoroughly plan and brief. Another way to prepare to exercise good judgment is to prepare thoroughly for the mission. Anticipating problems during mission planning and conducting a thorough briefing will help set the stage for safe decisions. Part of that planning includes anticipation of stressful or high accident potential situations. Discussing weather divert options or briefing the O-dark-thirty traffic pattern activity could make the difference.

Divide crew responsibilities. Establishing effective crew coordination can help by dividing crew responsibilities. This helps reduce each individual's workload and minimizes confusion during stressful events. Recognize hazardous thought patterns among your crew and yourself, then take positive steps to intervene.

Fly the Plane

When a situation occurs inflight that taxes all your preparation, extends your systems knowledge to the limit, and challenges you as you've never been challenged before, **continue to fly the plane.** Take the time "to wind the clock" while you gather your thoughts. Then engage in problem resolving.

Although good flight crew judgment is a nebulous subject, there are techniques that will improve one's ability to make sound decisions inflight. Experience is something that comes only with time, but knowledge, skill and good judgment can be developed and nurtured. Flying safely is of prime concern to all in this profession. Remember, loss of an irreplaceable national resource or crew due to the exercise of poor judgment is inexcusable.

Safety — An Important Attitude

Capt Hastings J. Lamb III
341 SMW, Malmstrom AFB

I was recently appointed as the chief of the Wing Weapons Safety Branch at Malmstrom AFB. I've been working in Minuteman systems since 1964, however, this was my first formal assignment. For the most part, I've been fortunate enough never to have experienced nor contributed to any missile related mishaps. Considering I've worked around missiles for quite some time, I think that's quite an accomplishment. I know there are many others with more exposure and time in missiles who can say the same thing, and I congratulate you for your safe record. But the crux of the matter is not so much how I or others managed to stay out of harm's way; but **why** we managed to stay out of harm's way. In my opinion it all boils down to one aspect — attitude.

The old adage, you can lead a horse to water but you can't make him drink, certainly merits consideration at this point. How many times have you found yourself sitting in a weapons safety class thinking, "What am I doing here?" Just another requirement to fill and another boring class to sit through. Along the same line, how many of you "front line" supervisors have allowed those "minor" safety infractions to go unnoticed and uncorrected? What do you think was gained by such "permissiveness?" An attitude expressed by your subordinates that you're a good supervisor for not nagging . . . or, the supervisor doesn't care so why should I!

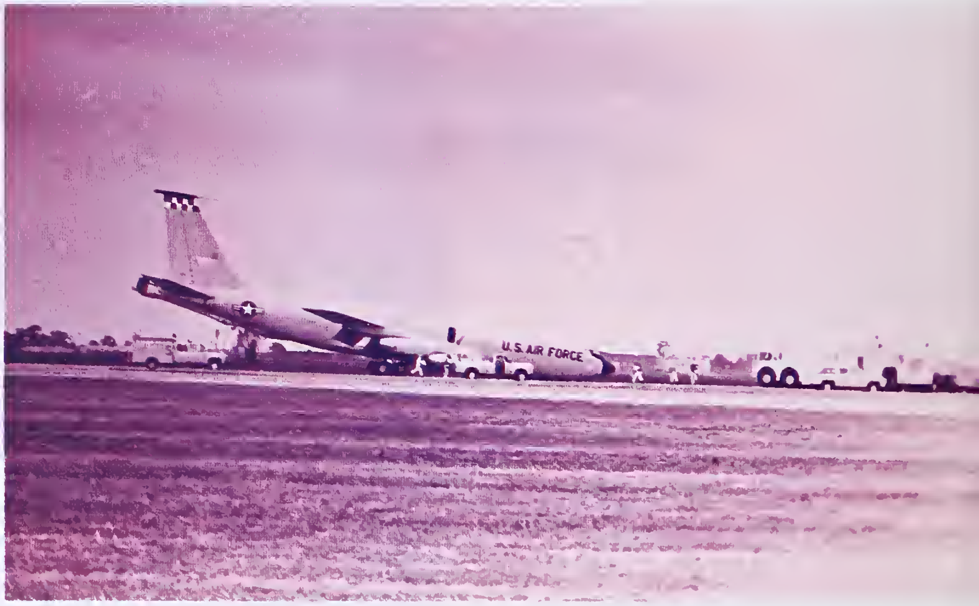
How many of you have found yourselves in similar situations? I know I have. Let's face it, we all have at one time. And that's where attitude develops. The true professional realizes that he/she can fall into this trap and takes action to avoid it. Active participation in a class stimulates interaction and dissemination of meaningful information. Concern for your personnel and constructive criticism help foster a good safety attitude. Showing concern for doing the job right and safe the first time can't help but become contagious.

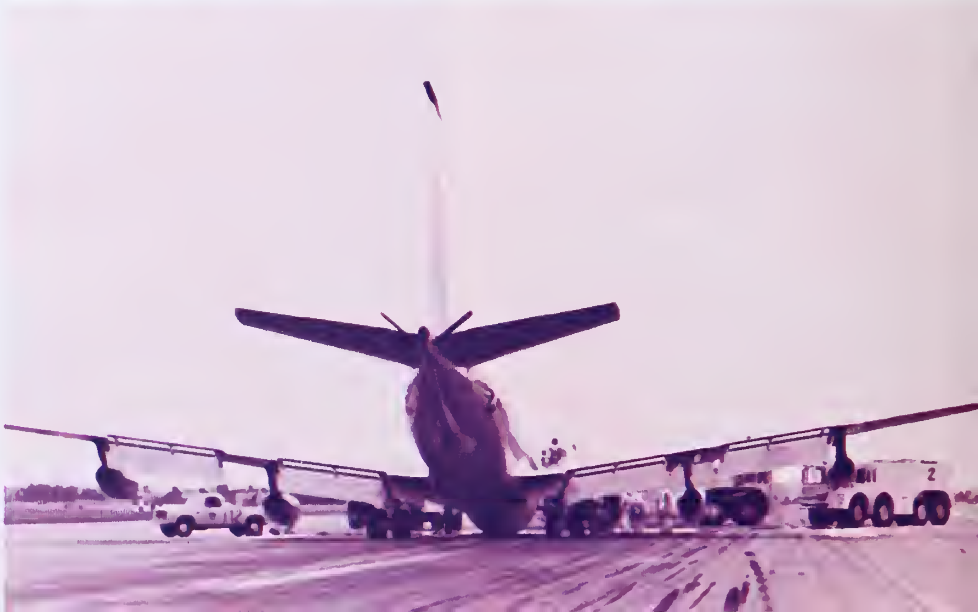
The Minuteman system is dynamic; procedures and equipment are constantly changing. These changes challenge us to adapt on a daily basis. If we don't adapt and become familiar with the changes while fostering development of a safe attitude, we become a danger not only to ourselves but also to those we work with. Contrary to what many think, what you don't know can kill you! This becomes true especially in the hazardous environment associated with a major weapon system.

So if you haven't gotten the message by now, it's time to stop and think. Don't think so much about the time you're wasting in a safety training class or while correcting safety violations during task completion; rather think about what you are going to do to make your working environment safer. Do it if not for your sake, then for the sake of others affected by your actions. And if you don't want to think about it and act on it, then you're in the wrong profession and should get out before you hurt yourself, or worse — someone else. **Think safety! The attitude you change can be your own.**

Eight is Not Enough!

Lt Col David E. Faught
97 BMW/DOV, Blytheville AFB





For those of us who watched that popular TV show, Eight is Enough, it was always interesting to tune in each week and see what situation the cast had gotten themselves into, and to know that no matter how bad it was, they would always find a way to provide a happy ending.

Well, in my story, I thought my "cast of eight" could handle anything that could possibly come up. Imagine this for a crew lineup: two Stan/Eval IPs, one Stan/Eval CP, two Stan/Eval IBOs, two Training Flight INs, and one highly qualified AC. Now that's the kind of crew you'd like to have on your next 1CEVG checkride. Our mission for that day happened to be a Fuel Savings Advisory/Cockpit Avionics System (FSA/CAS) orientation and training mission. Only one of the IPs and one of the INs were FSA/CAS qualified and all the other crew members were scheduled for hands-on training.

The crew showtime for the mission was 0200 with a scheduled takeoff time of 0630. The entire preflight was uneventful and the FSA/CAS performed exactly as advertised. At 0630 the aircraft launched on time and completed the air refueling and navigation portions of the flight without incident. After four successful touch and go landings, it was time for a full stop. The mission had been very successful up to this point and everyone was ready to call it a day. It was now approximately 1230 and we were down to 14,000 pounds of fuel. As we rolled out on VFR downwind, we completed all checklists and lowered the landing gear, and then it happened — the nose wheel was not down and locked. I quickly checked all the cockpit indications, and upon finding everything normal, I recycled the gear. Again the nose wheel failed to extend. Now it was our turn to see if eight were enough for this situation.

We immediately turned out of the VFR pattern and entered the IFR pattern at 2000 MSL. We declared an emergency and contacted the command post. Everyone in the cockpit was busy referencing the landing gear emergency checklists in the Dash One. It didn't take long for us to run all of the applicable checklists with the same result — the nose wheel would not come down.

We informed the command post that we had run all of our checklists and that we would have to land soon unless we could get additional fuel. Luckily for us there was an EC-135 in our local traffic pattern and he had overheard the situation. It didn't take long to get him vectored over to us and to start the emergency reverse air refueling checklist. With fuel running low, and clouds between 2000 and 8000 feet MSL, we decided to attempt to hook up at 2000 feet. It was rather difficult getting that first contact, but once we were joined up we began a slow climb to gain more altitude. As we skirted around several clouds the turbulence became quite intense and we had to disconnect with the EC-135. We then expedited our climb to 8000 feet and tried another hookup. This time we were successful and onloaded about 8000 pounds — all we could take on at one time while keeping our center of gravity from exceeding our aft limit.

After receiving fuel we maneuvered away from the EC-135 and tried manual extension techniques, hydraulic assist and G maneuvers, and anything else we could think of. It was all to no avail: the nose wheel would still not come down. We received help from the other aircraft, the command post, higher headquarters, and even Boeing Military Aircraft itself. No one could come up with a technique to lower the nose gear.

About every 20 minutes we would have to return to the EC-135 and take on another 8000 pounds. Then off we would go to try lowering the gear again and again. After about an hour of attempts we were forced to climb to 15,000 feet because the weather was moving in and being in the top of some buildups made it very difficult to refuel. Memphis Center was also very busy and we were constantly being vectored around arriving traffic and thus were restricted to ever decreasing arcs around Blytheville. It gets very demanding when you can't just worry about your own aircraft, but also have to run random refuelings every 20 minutes and vector for traffic at the same time.

Several hours into this ordeal a KC-10 arrived on the scene and it was decided that he would take over the refueling responsibility from the EC-135. After demonstrating that we could take fuel from the KC-10, the EC-135 offloaded all the fuel he had available and departed the area. It wasn't until much later we learned that the EC-135 had a 1CEVG crew onboard. Not a bad lineup to have on the other end of the boom in an emergency. Well, the 20 minute cycle commenced again with us onloading fuel and attempting to lower the gear. This pattern continued for some time until we learned that the KC-10 was running low on fuel and would have to depart the area or land at Blytheville unless he obtained some more fuel. Can you imagine that, here we were having a real emergency and a KC-10 is almost out of fuel. Who ever heard of a KC-10 running out of fuel? Well, here he was in a worse situation than we were and things never looked so bad.

Unknown to both of us, a strip alert tanker at Blytheville was already at the end of the runway adjusting his gross weight for takeoff. It was now a race against time to see if they could launch the tanker before the KC-10 would have to land at Blytheville. The KC-10 was reporting that he was down to about 12,000 pounds of fuel and we were down to about 15,000 pounds. We both observed the strip alert tanker takeoff and maneuvered ourselves to decrease the rendezvous time. Within minutes after takeoff, the strip alert tanker was offloading fuel to the KC-10 and we were screaming for fuel ourselves. The KC-10 took about 10,000 pounds from the strip alert tanker and came over and refueled us. It was very comforting to get that fuel since we were down to 800 pounds of fuel in the aft body tank. Once again the KC-10 returned to the other tanker and completed his full onload. Now we were in good shape, with ample fuel to handle our needs.

Our final efforts to lower the landing gear involved depressurizing the aircraft, removing the sighting window for the nose gear and literally trying to pry the gear down. With all eight crew members now on oxygen it didn't take long to deplete both the liquid and gaseous oxygen systems. The boom operators were taking turns down in the wheel well using portable oxygen cylinders which had to be recharged about every five minutes. Needless to say, everyone was exhausted and disappointed as the gear still refused to leave its up and locked position. Several times the gear indicator would flicker a brief intermittent position, but then nothing.

After the oxygen was gone we had to once again descend to 8000 feet. It was getting dark now and the crew had been up for almost 18 hours. The crew was noticeably dejected about not being able to get the gear down, but it was time to call it quits and get the aircraft down on the ground. With command post concurrence on our decision to land, we went about our task of briefing all emergency procedures and taking appropriate positions for landing. An instrument approach was initiated at about 1950 local, over 13 hours after initial takeoff. The approach to landing was right on the money. On short final, all body fuel was dumped to preclude any possibility of fire after landing. Approaching the overrun, all of the fuel pumps and valves were closed and the final landing center of gravity was 34.8%. The aircraft touched down on centerline, 1000 feet down the runway and the speed brakes actuated. The nose of the aircraft appeared not to move, it just hung there above the horizon, almost refusing to come down. At about 50 knots, the nose was gently lowered to the runway and the aircraft was brought to a stop with about 3500 feet of runway remaining. The crew was then evacuated from the aircraft out of the right overwing hatch in less than 30 seconds; a time that would make any life support unit proud.

The final results of this incident — approximately $30,000 worth of scrape damage to the aircraft; all eight crew members alive and well; the aircraft back in service in less than six weeks; 10 successful reverse air refuelings conducted; almost 100,000 pounds of fuel onloaded by a KC-135. Not a bad record for a flight of only 13.5 hours!

If you ever anticipate that this sort of incident might happen to you, you just might want to hand pick your crew of eight. But take it from someone who has been there — eight may not be enough!

About the Author

Lt Col Faught has been associated with the KC-135A since July 1970. He upgraded to aircraft commander in 1972, and to instructor pilot in 1973. He attended CFIC at Carswell AFB in 1974. He has served as Chief, Squadron Training Flight at the 310 AREFS, Plattsburgh AFB; the 11 AREFS, Altus AFB; and the 97 AREFS, Blytheville AFB. He has also served as the Chief, KC-135 Stan/Eval Branch at the 97 BMW, Blytheville AFB.

HEADS UP FLYING CLUB

Crew S-102, 97 BMW, Blytheville AFB consists of (L-R): Capt Russell Cochran, TF IN; 1Lt Darrell Pratt, CP; Capt Robert Sauers, AC; Capt Stephen Wolborsky, XP; TSgt Jerry Wilson, BO; and Capt Walter Price, TF IN. Not pictured is Lt Col David Faught, S-101 AC, and MSgt Larry Burrus, S-101 BO. The knowledge, expertise and coordination of all crew members resulted in the successful recovery of the aircraft and no injuries to the crew. Damage was minimal and was locally repaired.

LCC REVITALIZATION

Maj Michael Spiegelman
HQ SAC, DOMM

Day in and day out, our ICBM combat crew members must endure and react to a multitude of complex weapon system, security and Emergency War Order (EWO) requirements, yet remain ever vigilant and not become overwhelmed by the numerous lights and bells, beepers, and buzzers. More demands are being placed on crew members today than ever before. Missile unit staffs are concerned that the crew force may be getting saturated by alert duty requirements. These concerns center around more complex alert duty resulting from new nonintegrated hardware and increased procedural requirements levied by all levels of command over the years.

When the Minuteman weapon system was first deployed in 1961, operations were relatively simple. Crews essentially "baby sat" the weapon system and few actions or reactions were required. Command and control was handled through the primary alerting system and the HF and UHF radios. Alerts consisted of a two-man crew, with each crew member alternating rest periods in the launch control center (LCC) for 24 hours.

When force modernization began in 1966, a third crew member was added to help with the increased workload that accompanied the complexities and increased capabilities of the modernized system. Crew members were not allowed to sleep in the LCC, but each crew member rotated upstairs for rest. Both consoles were manned around the clock to handle the dissimilar functions. The two-man crew concept was again implemented in 1968 with crew members scheduled for no more than 12 continuous waking hours of alert. Crews stayed at the sites for 36 to 40 hours, rotating alert shifts with another on-site crew.

In 1976, SAC implemented RIVET SAVE which reduced Minuteman operating costs by cutting the crew force by nearly one-third and returned alerts to 24 hours allowing one member to be in rest status. This concept remains in effect today.

Concurrently, modifications increased crew requirements and workload. The addition of the SAC Automated Command and Control System (SACCS) and the Survivable Low Frequency Communication System (SLFCS) increased procedures and message receipt actions. Command Data Buffer provided remote missile retargeting capabilities. The Guidance Improvement Program added new missile guidance calibration programs, and the C^3 Program added AFSATCOM and the SLFCS 616A modification. This latest communication expansion added 15 procedural checklists to the operations technical order, added audible alarms, and increased monitoring requirements. All in all, one crew member must now remain alert and perform more complex procedures in the LCC than previously required of two crew members continuously alert and working at their respective consoles.

This is not intended to be a horror story and indeed it is not because headquarters agencies and missile wing staffs are working hard to improve the situation. Many efforts are either underway or have been completed to improve missile combat crew working conditions and enhance EWO reaction capability. The SAC missile staff, from the CINC on down, are keenly aware of the problems and have been working diligently to address the current concerns about crew workload and other associated issues.

An LCC Operations Efficiency Working Group identified many problems and is determining potential solutions. The alarm noise level of SACCS, SLFCS, and AFSATCOM was reduced by several short-term modifications. A noise survey conducted by the 341 SMW, Malmstrom AFB, found that, in some cases, these modifications reduced the alarm noise levels by over 25 percent. A remote SACCS alarm reset pushbutton was installed in WS133B LCCs at the deputy's console to facilitate crew reaction. The SAC Digital Information Network (SACDIN) will soon replace SACCS and provide some interface/integration of both SLFCS and AFSATCOM and thus reduce the number of communication alarms and message receipt actions. HQ SAC and Ogden ALC are working to procure a new force-wide common weapon system printer which will be quieter and more efficient than the existing printers. A new quieter motor generator is also being studied. Missile security procedures are under revision and will simplify crew responses. Emergency War Order procedures were modified to streamline crew actions for launch reports and exercise emergency action messages.

An LCC Hardness Configuration Working Group is examining ways to enhance LCC hardness integrity. One program already implemented involves refurbishing LCC console chairs which are in disrepair and represent a hardness degrade. Forty-eight chairs at six missile units have been refurbished. The working group is also looking at ways to improve storage provisions and determine actions units can take to reestablish LCC hardness.

HQ SAC is aggressively embarking on an ambitious program to integrate LCC weapon system and communications functions. We plan to replace existing LCC consoles with state of the art consoles having identical capabilities except for launch critical functions. Crew members will be able to perform all weapon system commands and tests, communication actions, and alarm resets from either console. The new consoles are expected to have video display units rather than numerous, multicolored lights, and will take full advantage of all existing and planned interfaces. The integration effort also intends to consolidate many of the equipment racks to reduce the load on several LCC support systems. Ideally, this effort will be combined with the Minuteman computer aided message processing system (which will automate EAM decoding) and the Minuteman II flexible targeting modifications.

Many exciting changes are on the horizon for improving the efficiency of LCC operations, improving the work environment, enhancing weapon system safety, and enabling us to maintain our current ICBM force into the 21st century. We are on the edge of that new horizon.

The Alternate Rendezvous

CFIC, Castle AFB

Picture yourself flying along on a normal mission enroute to the ARCP. The CDU WARN light illuminates on the INS, displaying an action code of 01. Being an extremely sharp individual, you shut down the INS and refer to DNS as your backup aid for the rendezvous and navigation. Meanwhile, the Doppler is beginning to go into memory at regular intervals, rendering the Doppler Navigation System (DNS) relatively inaccurate for position. It would be a definite advantage at this point to have considered some of the alternate rendezvous procedures described in the Dash 3.

We will consider these alternate rendezvous in the order in which they appear in the manual. The first thing to consider is the beacon capability of your receiver. If the receiver has a beacon and you can paint it on the radar, you have some things to consider prior to the rendezvous. What configuration should be used to set up the scope? Does the receiver have a radar that can be used with my beacon? Are there any techniques which will enhance my chances for a successful rendezvous? The answer to all these questions will be covered in the following paragraphs.

If you will turn on the "way-back machine" for a minute, some of

us still remember when the electronic beacon was the primary means for conducting a point parallel rendezvous. It is still an excellent means for running or backing up any rendezvous. The Dash 3 specifically states, "crews will utilize all available means to accomplish the rendezvous."

Here at CFIC we like to use the mag course method for configuring the radar. This technique ensures that the beacon will move from the top to the bottom of the scope so the reticle can be used to determine the offset. Begin by determining the magnetic course from the ARIP to the ARCP. Use the reciprocal of this mag course to configure the radar for tankers while receivers use the actual mag course. Set the applicable mag course in the heading select and check the radar scope for the proper presentation. The heading marker should be firing at the top of the scope. For instance, if the mag course from the IP to the CP is 320° then the HEADING SELECT should be set to 140° for the tanker radar. If the N-1 is indicating 140° then the heading marker should be firing at 360° on the radar scope. If the N-1 is indicating 120° then the heading marker should be firing at 340° on the radar. (140-120 = 20, 360-20 = 340) The heading marker should reflect the difference between the mag course and the actual N-1 indication (i.e., 140° mag course versus 120° N-1 heading). Once the HEADING SELECT is currently set to the mag course, the scope is configured properly for the rendezvous and no other HEADING SELECT adjustments are required. The only changes will be the N-1 alters for drift and course correction.

Once you have positively identified the receiver beacon, you must determine if it is on the proper offset. Move the reticle over to the predetermined offset and adjust accordingly. Remember "the tanker will clearly establish which airplane will be maneuvered." If the receiver appears to be significantly off the computed offset, use your judgment to alter either the receiver or the tanker to correct it. Make the alteration a significant cut so the offset can be corrected prior to the turn range. If the aircraft is not on the rendezvous heading prior to the turn range, it tends to complicate the actual point at which the tanker should start the turn.

Common TACAN is the second alternate means of rendezvous we will consider. The easiest way to work with a common TACAN is when it is conveniently aligned with the track between the ARIP and ARCP. Something you should check on mission planning day is the availability and alignment of the radio navigation aids. Frequently, there will be a low TACAN near the ARIP or ARCP that may not be printed on the JN series chart. If the TACAN you want to use is offset to the side of the rendezvous track, a good technique is to draw a mag course overlay on the TACAN. You can label every 10° of mag course and arc off every 10 NM of distance. This makes plotting your position and the receiver's position more expeditious, as well as providing an exact reading on turn range and offset. Finally, remember to add your DMEs if the TACAN is located on course between the ARIP and ARCP. Too many crews have subtracted one from the other and have they been surprised when they found themselves 50 NM in front of the receiver.

A corollary to common TACAN is INS/DNS distance from a common point, such as ARIP/ARCP. For example, when both receiver and tanker have a reliable INS, the ARIP from a tanker standpoint may be inserted as a waypoint to help determine the range between airplanes. Use the same procedures as common TACAN to compute the distance between airplanes.

The third alternate method of rendezvous is ADF bearings. We feel the most effective way to use ADF is with the mag course bearing method. This eliminates wind effect from consideration since wind affects mag heading, not mag course. Consider, for example, a rendezvous with a B-52 receiver and a tanker mag course from ARCP to ARIP of 153° (the reciprocal of the receiver's inbound mag course of 333°). If the computed offset is 10 NM, you would expect 10° of displacement to the left of 153° at 60 NM separation (60 to 1 Rule), assuming the receiver is on course. At 30 NM separation, you should see twice the displacement, or a 133° bearing on the pilot's RMI (#2 needle). At the turn range, the pilot should be reading a bearing of 127°, or 26° displacement left of the tanker's mag course. If you ever do an ADF rendezvous for real, you will probably be without DME for separation. This brings up the next method to back up a rendezvous, timing.

Timing is a simple aid and should be used on every rendezvous. It can be started as soon as the tanker is rolled out toward the receiver and positive identification and distance is established. Another effective technique is for both the pilot and navigator to begin timing at the same distance. Let the pilot's clock run and update the navigator's timing throughout the rendezvous, every 10 NM of closure for example. This gives a backup to timing in case one of the clocks is inoperative. Remember, the Dash 3 timing chart is based on an approximate 21 NM turn range. Altering either aircraft significantly will invalidate timing accuracy. Fortunately, this error will tend to result in an underrun situation.

There are other alternate means to rendezvous you can employ. Remember to use as many alternate means as you can to ensure a successful rendezvous. "Ground radar assistance will be used to the maximum when conducting a rendezvous with significantly degraded equipment to ensure a successful rendezvous." Don't forget that the receiver and ARTCC can be excellent sources of distance information.

If you haven't thought about alternate rendezvous procedures lately, we encourage you to review the Dash 3 and discuss them with your crew. A little forethought during mission planning can prevent a load of scrambling when things go awry in flight.

Gen Larry D. Welch, SAC commander in chief (right) and Col Teddy E. Rinebarger, 341 SMW commander, cheer as two of Malmstrom's "First Aces" hold up the Blanchard Trophy.

MALMSTROM WINS!

341st Takes Home The Blanchard

Mr Ken Maassen
Associate Editor

The "First Aces" from Malmstrom AFB proved they held the best hand as the 341st Strategic Missile Wing won the coveted Blanchard Trophy at the 1986 SAC Missile Combat Competition held May 16-22 at Vandenberg AFB.

Snaring first place finishes in the Missile Operations, Security Police and Information System categories, the 341st teams grabbed a total of 2805 points of a possible 3,000.

Olympic Arena '86 marked the last year of competition for Titan II Intercontinental Ballistic Missile crews and, appropriately, the 308th SMW from Little Rock AFB, Ark., and the 381st SMW of McConnell AFB, Kan., fought to the end for the Blanchard trophy which signifies the best missile wing in SAC. After three days of intense competition, the Titan teams tied with 2,799 points each. The 381 SMW was awarded second place through the tiebreaker procedures.

The "Razorbacks" of the 308th took home the titles of Best Civil Engineering in SAC, Best Titan Munitions, Best Titan Operations Crew, Best Titan Information Systems and Best Titan Security Police. The "Mean Green Machine" of McConnell took first place honors as Top Titan Wing with Best Titan Operations and Best Titan Maintenance. The maintenance honors resulted from individual titles as Best Titan Missile Maintenance Team, Best Titan Pneudraulics Team and Best Titan Facility Maintenance Team.

Fourth place overall went to the "Mighty 90th Troopers" of the 90th SMW, F. E. Warren AFB, Wyoming. Their total of 2,774 points included the title of Best Security Police Tactics Exercise.

Another tie score determined fifth place in this year's competition with Whiteman AFB and Minot AFB teams earning a total of 2,768 points. The "Missouri Mules" of the 351st SMW from Whiteman earned first place finishes in Minuteman Missile Handling and Minuteman Pneudraulics. The "Roughriders" of the 91st SMW from Minot wrapped up Best Overall Missile Maintenance as well as Best Minuteman Operations Crew and Best Crew in SAC.

Col John E. Chambers, 308 SMW, Little Rock AFB, and Col Barry M. Teitler, 381 SMW, McConnell AFB, display the special plaques awarded to the two Titan wings in commemoration of the wings' last missile competition. Gen Larry D. Welch applauds the current and past efforts of the Titan wings.

SAC's missile wing commanders draw starting positions from the Blanchard Trophy to begin the 1986 Missile Combat Competition, Olympic Arena. From left, they are: Col Michael T. Graydon, 351 SMW, Whiteman AFB; Col Christopher I. Branch, 91 SMW, Minot AFB; Col Barry M. Teitler, 381 SMW, McConnell AFB; Col Robert W. Parker, 321 SMW, Grand Forks AFB; Col Arlen D. Jameson, 90 SMW, F. E. Warren AFB; Col Teddy Rinebarger, 341 SMW, Malmstrom AFB; Col John E. Chambers, 308 SMW, Little Rock AFB; and Col Arthur E. Johnson, 44 SMW, Ellsworth AFB.

Finishing seventh this year were the "Warriors of the North" from the 321st SMW, Grand Forks AFB, N.D. who started strong and led the first two days of competition.

The "Black Hills Bandits" of the 44th SMW from Ellsworth AFB, S.D. finished eighth in Olympic Arena '86 but did so with grace and style. They took titles as Best Minuteman Civil Engineering Team and Best Minuteman Facility Maintenance Team. Particularly noteworthy was a stunning operations crew score of 298 — the best single crew exercise in Olympic Arena competition since 1972.

The sentimental favorites at this year's competition were clearly the two remaining Titan II wings who are competing for the last time after 19 years of Olympic Arena contests. With the completion of Titan II deactivation in late 1987, next year's competition will host only the six Minuteman wings. The 381st "Mean Green McConnell Machine" shares honors as four-time winners of the Blanchard with the 351st SMW of Whiteman AFB, while the "Razorbacks" of the 308th were the defending champs.

The annual missile competition provides an opportunity to refine techniques and procedures, exchange professional information, recognize outstanding individual and team performance and enhance **esprit de corps.** As Lt Gen James L. Light, commander of Fifteenth Air Force, told the competitors at the opening ceremony, "You are ready, you are technically skilled and you are able to work together as a team to reach a common objective. This competition shows any potential aggressor that the people of the Strategic Air Command take their motto very seriously."

Best Missile CE Team — 308 SMW.

Best Missile Operations team — 341 SMW.

Best Missile Information System team — 341 SMW.

U.S. Air Force Photos by TSgt Doug Gruben

Best SP Unit Confidence Course Exercise — 341 SMW.

Best Titan Munitions Team — 308 SMW.

Best SP Unit Combat Rifle Course Exercise — 341 SMW.

Best Titan Information System Team — 308 SMW.

Best Minuteman/Missile SP Team — 341 SMW.

Best Titan Facility Maintenance Team — 381 SMW.

Best Titan Crew — 308 SMW.

Best Titan Pneudraulics Team — 381 SMW.

Best Titan Wing — 381 SMW.

Best Minuteman Pneudraulics Team — 351 SMW.

Best Titan Missile Maintenance Team — 381 SMW.

Best Minuteman CE Team — 44 SMW.

Best SP Unit Tactics Exercise — 90 SMW.

Best Minuteman Facilities Maintenance Team — 44 SMW.

Best Minuteman Missile Handling Team — 351 SMW.

Best Minuteman Crew — 91 SMW.

KC-135: Concepts of FSA/CAS

Capt David J. Alexander
380 AREFS, Plattsburgh

As the KC-135 re-enters the world of high technology, (it was probably pretty 'high-tech' when it was built) it will bring many crew members along with it, probably for their first time. The Fuel Savings Advisory/Cockpit Avionics System (FSA/CAS), like any new system introduced into a comfortable environment, causes some apprehension among those who must learn how to use it. Like any computer, it is capable of performing many tremendous feats, but only if the operator knows what the computer can do, and how to tell the computer to do it. Crews flying the airplane without the required understanding will see the FSA/CAS as an expensive takeoff data calculator they can't depend on, and a handy CG computer. It is much more, in fact the Mil-Std-1553 Data Bus incorporated with the system is key to the -135 avionics modernization system. This article will introduce the uninitiated to the abilities of the FSA modified airplane.

For any given situation of gross weight, winds, temperature, and leg distance, there exists an altitude and airspeed that minimizes fuel burn. Our objective is to operate, whenever possible, in that optimum mode. In the refueling business, requirements other than economy often dictate our actions. During air refueling, a specific altitude and airspeed are required, and those requirements drive our decisions. During the cruise to the refueling track however, we are presented with an opportunity to let fuel conservation have a hand in the profile. Envision a mission involving a takeoff and climb to an ARCP very near the homedrome (Fig. 1). Even if optimum altitude for the airplane's gross weight were FL 350, we wouldn't save fuel by climbing to that altitude just to descend to FL 210 for refueling. Maybe we couldn't even get to 350 before the CP; it may even be difficult to get to 210 before the CP. In such cases, level off altitude choice is easy.

If, on the other hand, the ARCP is any great distance from takeoff (Fig. 2), it might benefit us to climb to some higher altitude for the cruise to the CP, and later descend to 210 for the refueling. During mission planning, you could figure out best range altitude for your projected gross weight, but would it be worth spending the extra fuel climbing there for the distance of the leg? You could work that out for your projected conditions. Maybe it's a very long leg, and 280 is optimum for a long time, but then you'd do better at 330. You could work that out too. Then once you're there, you could easily blow your savings by starting descent too late, and needing speed brakes or gear to get down on time. Here again, given time and motivation, you could compute that precisely. Suppose you do all that planning, but during preflight discover scheduling has added 30,000 pounds to accommodate an additional receiver. Or the 270/50 winds are now 330/100. Completing the mission under changing conditions is easy, but your time-consuming, fuel-saving computations just went out the window.

Simply put, the FSA computer is designed to do all those calculations — and more — continuously, accurately, and quickly. It uses actual winds, aircraft gross weight, and crew inputs to determine the most fuel efficient profile for any given mission. Once derived, the computer tells you when to start climbing, your target

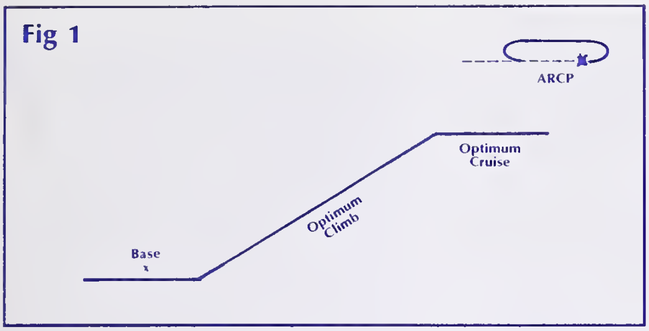


Fig 1

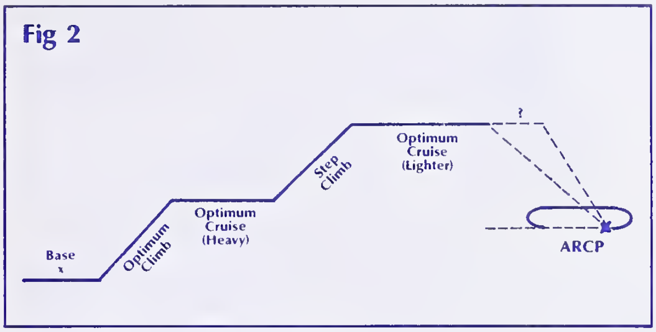


Fig 2

altitude, and when you'll get there. When conditions change, data is recalculated to present current optimum data.

To arrive at its figures, the FSA/CAS collects data from a variety of sensors, and from many parts of the airplane. With all its data, the FSA/CAS can work out a great deal of information in addition to the primary fuel savings advice. Happily, the system provides that additional information to the crew during flight, which constitutes many of the "fun" advantages of the system. Other FSA generated figures available include: (1) Takeoff data (still in development at AFLC, Ed.); (2) EPR and airspeed advisories throughout flight, such as constantly recalculated MRT/NRT figures during climb, exact EPR required to maintain pressurization during descent, and EPR necessary to precisely hold desired airspeed during cruise, such as a nav leg; (3) TAS, GS, OAT, and temperature deviation in real-time; (4) Landing data; (5) Endurance data, measured both in pounds and time; and, (6) All INS/DNS data.

Installed at the same time as the FSA/CAS is the new digital fuel panel. Along with the digital quantity displays, the panel has a fuel totalizer and an offload totalizer. Also, there are two presentations of center of gravity, in graphic and digital format. Again, data is calculated and updated in real-time. Low quantity warning lights are available for every fuel tank installed with a pump. In other words, the FSA/CAS modification provides lots of useful information, but let's return to the main topic of this article, and discuss fuel savings.

The secret of fuel savings is to fly at optimum altitude and airspeed whenever possible. What we must tell the FSA/CAS is when we must fly a specific airspeed and/or altitude, and when we have enough flexibility to use optimum figures. Sometimes, we can try to fly optimum altitudes throughout a flight when we fly airline style from one point to another. On some missions, we have that flexibility for only a short time or not at all. The point is, whenever we can fly more efficiently, we should. With FSA/CAS we can have optimum numbers in real time, with relatively little effort.

If you haven't seen the FSA computer screens before, there's a magnitude of data displayed, and even more planned. The heart of the fuel savings system, however, is found on FSA CRZ SEL 1/2. That's defined as the Fuel Savings Advisory Function, Cruise Mode Select page one of two pages. On that page you will enter from zero to three altitudes within a space that looks like this:

[/ /]

Unimposing, to say the least. Within the limits imposed by the system, there are three general options:

1 — You can enter one, two, or three altitudes at which you wish to fly. The computer will select the most fuel efficient of the altitudes given, and recommend flight there. Ex: [250/250/250] or [250/290/350].

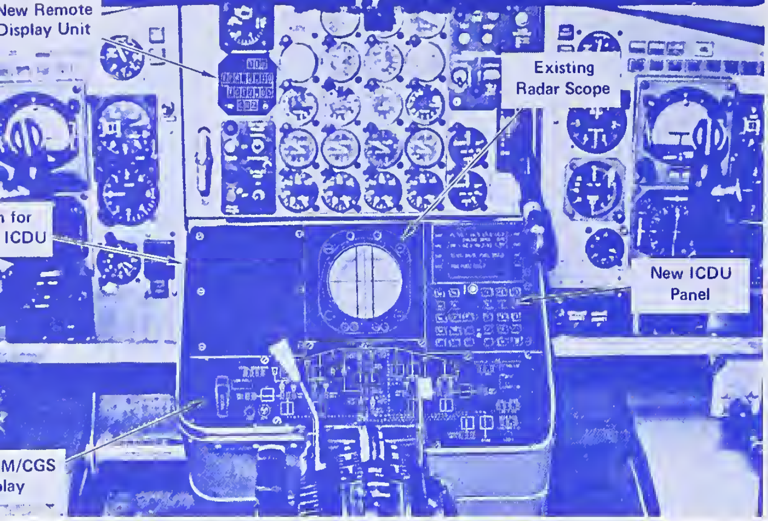
2 — By bracketing the altitudes you wish to fly, say 220 to 350, and selecting the interval for step climbs between the two extremes, say 4000 ft, you can tell the FSA to pick an optimum altitude between 220 and 350, direct initial climb to that altitude, and direct subsequent step climbs when greater efficiency would be gained. That entry would be [220/040/350]. Note that an entry of [300/040/380] would be functionally identical to the entry [300/340/380].

3 — The most flexibility is given the FSA by not entering any altitudes on cruise select 1/2 at all. FSA will fill in the blank using 2000 foot step climb intervals, (if appropriate), and the lowest and highest altitude to be recommended for the flight.

There are numerous caveats to the selection of an optimum altitude. During air refueling, you require a specific altitude and airspeed. During an enroute descent for landing, you want to reach the IAF at a low altitude and low airspeed, so you can configure and land. If the FSA knows your intentions, it will develop the point from which you need to begin your descent and tell you about it, calling that a top of descent. The IAF would be the bottom of the descent, and lo and behold, the FSA calls it that (BOD).

In entering each waypoint into the FSA and the INS/DNS, we can enter several desires beyond longitude and latitude. The choices are winds, altitude, IAS, fuel transfer, and fuel transfer delay. There are no yes/no blocks to select, such as AR or BOD. Instead, the computer interprets combinations of waypoint data as identifying these waypoints.

When you define descent for landing points, usually the IAF for the low altitude approach you want to fly, you would insert the altitude and airspeed you desire at that point, perhaps 4000 ft and 200 knots. The first waypoint for which you supply an altitude and an airspeed is interpreted as a bottom of descent. The second



Cockpit photo showing placement of new system displays

waypoint you so identify will be the alternate bottom of descent, and the FSA will project no additional information beyond those two positions.

For refueling, you must also enter a flight level and an indicated airspeed. To preclude interpretation of that entry as a BOD (and the end of the mission), you must also insert a fuel transfer value. This minimum combination defines an air refueling waypoint. Consider flight to the CP for a standard point parallel. You will arrive at the CP and maintain 275 from that point until completion of the rendezvous. For the FSA, you identify the altitude and airspeed you'll fly. Since it isn't a BOD point, you must insert a fuel transfer value, usually -1, for a 1000 pound offload, which is the smallest figure you can enter. On subsequent refueling legs, you would enter similar information, dividing the total offload equally among the separate legs. Remember that each waypoint identifies your intentions for the leg between it and the following waypoint. (Waypoint data for point 5 applies for the trip from 5 to 6). For that reason, no fuel transfer should be given for the EAR point, since you won't be transferring fuel after EAR. Since there's no fuel transfer number, you shouldn't enter an IAS and FL, since EAR is unlikely to also be your desired BOD.

On a typical cruise flight, you would want the machine to have fairly accurate data from which to make its predictions, and winds can play a large part in the equations. If you supply winds for a waypoint, you must supply the flight level at which those winds are forecast.

There are numerous "optimum" figures in flying, each of which minimizes some value, such as distance in the climb, fuel used per minute (endurance) or fuel used per mile (range). The other major data to be supplied to the FSA are the profile selections for climb, cruise and descent. These selections determine the selection of airspeed and altitude advisories during the mission.

For climb, we select a profile and a thrust setting. Each of the profiles next described will be computed based on the MRT/NRT setting selected by the crew. With that in mind, the three climb profile choices are: enroute, optimum and max rate. Enroute is easiest: it's appendix data, 250 below 10, 285 above until 32,500 ft, and .78 Mach until level off. Optimum climb will advise the most fuel efficient flight path, within the limits of a 250 knot limit below 10,000 ft. (The crew can remove that limit when necessary.) Above 10,000 the airspeed will probably exceed 300 knots, and will save approximately 300-600 pounds per mission. Max Rate is described as best rate of climb. Since rate of climb is measured in feet per minute, this must be best time to climb. Best angle of climb (L/D Max) is unimplemented on the FSA/CAS.

Cruise altitude selection is a complicated process involving the altitude selection process reviewed above, plus the options of best range, endurance, and IAS/IM hold. If you select best range, the computer will select best range altitudes based on your entry on CRZ SEL 1/2. If you select endurance, you must enter exactly one altitude on CRZ SEL 1/2; and if you desire IAS/IM hold, you must also supply an airspeed.

It is important to note that the FSA/CAS is constantly recomputing data, including altitude selection. You can therefore change any of the options you desire during flight, and anticipate a new profile based on your updated selections. So if you must fly a particular altitude enroute to the refueling, you can enter that one altitude for the trip out. Then, during AR, you can change the altitudes selected on CRZ SEL 1/2, and the FSA will arrive at new recommendations for the trip home. If you have the time to experiment, you can enter many different selections, and look at the result of different options. The key to evaluating different profiles is the BOD fuel figure on AIR DATA 1/5. It will present calculated fuel at the fix for each profile, and will thus allow you to compare the fuel used by different profiles.

Like climb, EPR is a factor in descent, but here there are no choices. Instead the FSA/CAS will, throughout the descent, provide EPR advisories that will maintain the Dash 1 cabin pressurization schedule. You leave two engines at idle, set two at the EPR recommended by FSA, maintain the recommended airspeed with pitch, and the airplane will fly according to the descent option you select. There are once more three options: enroute, rate and optimum. As before, optimum gets you down with the least expenditure of fuel. Unfortunately, it also involves a great deal of time and distance, since the descent approximates L/D max, and commands airspeeds in the range of 220-240 knots. Enroute is the standard profile, 285 until 10,000, and 250 below. Rate allows you to select a rate of descent figure, and the system will direct power settings and airspeeds to maintain that foot per minute descent figure. Note the FSA/CAS will also calculate the point from which you must begin your descent in order to arrive at your desired bottom of descent point at the correct altitude.

Despite the "magic" associated with the FSA/CAS, it is only as good as the pilot operating it. The computer itself can't save an ounce of fuel, it can only provide information to the pilot who must interpret that information and make the proper decisions to operate the aircraft most efficiently.

The Amazing PLZT Goggles

Capt David Landry and Capt Joseph Connery
HQ SAC/XPFS, Offutt AFB

Virtually everyone has experienced a mild version of flashblindness at one time or another. Those "spots" before your eyes that you see after posing for the family flash photo are signs of mild flash burn. These appear as the eye focuses the flashbulb's light into a tiny spot on the retina of your eye. However, this mild form of flashblindness persists only a short time and recovery is complete. Now instead of looking at a tiny flashbulb, imagine a flashbulb a mile wide going off with the brightness of the sun. This would closely approximate the flash of light a flight crew might experience from a nuclear detonation.

No one can blink quickly enough to keep the light out. The normal person can blink in about a tenth of a second. Light can travel 18,600 miles in that time. If the burst is any closer . . .

Rest easy, flight crews that could be exposed to such an environment are equipped with the amazing PLZT Flashblindness Goggles.

How Do They Work?

PLZT is the acronym derived from the first letter of the chemical composition of the lenses: Pb — Lead, La — Lanthanum, Zi — Zirconate, Ti — Titanate. The PLZT material is sandwiched between two polarizing filters. The whole thing works because the polarization of the PLZT material can be changed electrically.

Normally when the goggles are plugged in, the light passes through the first filter, is twisted by the PLZT material, and passes through the second filter to the user's eyes. When special sensors detect a rapid change in light intensity, the electronic controller reduces the electrical input to the PLZT material so that most of the light no longer twists enough to pass through the second filter. This happens in one ten thousandth of a second (1,000 times faster than you can blink) thus providing flashblindness protection. The sensors continue to monitor the outside light intensity and adjust the filtering to keep the light passing through to your eyes at a safe level.

Are There Limitations?

In the past, SAC Tactical Doctrine (SAC 55-21) has included remarks limiting the goggles to four hours of continuous use. It was believed the performance would degrade, requiring the goggles to be unplugged to refresh the lenses. This misconception was highlighted during the development of the B-1B's flashblindness protection system. A follow-up study determined that this restriction only applied if the goggles were used daily. During peacetime, the PLZT lenses are only powered for short periods during maintenance testing; consequently, there is no daily buildup of electrical charge that could degrade performance.

A pair of PLZT goggles can be used throughout an entire SIOP mission without degrading to an unacceptable level.

During long periods of continuous use (20+ hours), an electrical charge will build up on the PLZT material. This buildup will affect how quickly the lenses darken. Leaving the goggles plugged in longer than this can cause permanent damage. When the thermal curtains are closed (for example, during high level cruise), disconnecting the goggles allows the charge buildup to dissipate, returning the goggles to their original capability.

No, it's not an alien from the planet Zorx but just a SAC crew member wearing the amazing PLZT Flashblindness Goggles.

PLZT goggles can adjust to a change in light intensity in one ten thousandth of a second. That's 1,000 times faster than you can blink.

A Flashy Future

The current goggles most aircrews fly with have EEU type lenses. An improved version of this technology, EDU type lenses, are to be mounted behind the B-1B windscreen, offering flash/thermal protection. "EEU" and "EDU" are both model identifiers. The new generation devices have better bonding gels, electronic controllers, improved light transmittance (how much light is transmitted in the normal or "open" state) and better edge sealants. These improvements also contribute to a much longer operational lifetime — estimated to exceed 72 hours. Future generations of flash goggles will incorporate all of these improvements.

PLZT goggles are the primary eye protection when the thermal curtains are open. Unplugging them from the helmet during closed cockpit portions of the mission is insurance that the goggles will be fully capable throughout the SIOP mission and beyond. The bottom line is a crew cannot afford to take chances with flashblindness. Fortunately, with proper use of the PLZT goggles, they don't have to.

Safety Technician

TSgt John H. Engle, 79 BMW Ground Safety Technician, Blytheville AFB, is SAC's Safety Man of the Month.

After seven years of recruiting duty, TSgt Engle returned to the safety career field in mid 1984. Through a thorough review of directives and standards, he was able to regain an extremely high knowledge of safety rules and regulations of the ground safety program. Due to the PCS of the former ground safety officer, TSgt Engle was selected to hold the position until the new GSO arrived. His positive attitude prevented degradation of the safety program as he collected, maintained, and devised publicity which aided immeasurably in the reversal of an adverse trend in ground mishaps. During this period, TSgt Engle also collected and prepared criteria to update 36 safety standards which are used by unit safety representatives base wide to ensure compliance and provide a safe environment. TSgt Engle ensured all inspections/evaluations due subordinate units were scheduled and completed. TSgt Engle's attention to detail and his outstanding desire and motivation to excel in his performance of safety duties were definite factors in Blytheville AFB realizing a 30 percent reduction in ground mishaps CY 1985 versus 1984.

Aircraft Maintenance

SSgt Joseph W. Crissman, 410 BMW, K. I. Sawyer AFB, is SAC's Aircraft Maintenance Man of the Month.

Fully qualified on the complex B-52H bombing-navigation system as well as the new AN/ASQ-176 offensive avionics system, SSgt Crissman's superior knowledge of all aspects of this intricate system is acknowledged throughout SAC as well as by members of Air Force Logistics Depots and civilian suppliers. As a recognized expert, SSgt Crissman provides inflight maintenance (IFM) training to flight crews. This training has been observed by numerous teams and other personnel and, without exception, has been rated as "excellent."

In addition to instruction, SSgt Crissman also flies regularly as an onboard systems expert and on numerous occasions has been lauded by the flight crew for performing inflight repairs which allowed completion of mission objectives.

He is also the shop PMEL monitor, responsible for over 493 pieces of equipment. He has maintained the wing's electro-optical viewing system at a remarkable 98 percent in commission rate, the highest in SAC. Under SSgt Crissman's leadership, the complex and delicate ASM-479AX test station has consistently achieved the lowest downtime in SAC.

Missile Maintenance

SSgt David L. Piontkowski, 394 ICBM Test Maintenance Squadron, Vandenberg AFB, is SAC's Missile (ICBM) Maintenance Airman of the Month.

As a member of the facility maintenance team (FMT) shop, SSgt Piontkowski has excelled as a technician and a leader through revising numerous job tasks for a smoother work flow. One of his recent tasks included the validation of a Standby Power System SAC Civil Engineering Manual. He also rewrote adjustment procedures for the diesel electric unit (DEU) overspeed switch, and was called upon to assist in a 100% rewrite of the FMT lesson plans. He has supervised many seldom performed tasks on site such as the diesel electric unit installation for the new Peacekeeper modification. He was called on to assist in the replacement of a launch facility air conditioner which had never been performed. Due to his technical knowledge, SSgt Piontkowski is assigned as the squadron adviser on missile potential hazard questions involving real property installed equipment. These attributes and more make SSgt Piontkowski indispensable to the ICBM maintenance force.

PROFESSIONAL PERFORMERS

Missile Crew

Crew R-035, consisting of 1Lt Gary L. Wilhelm, MCCC, and 2Lt Gordon R. Murdock, DMCCC, 90 SMW, F. E. Warren AFB, is the SAC Missile Crew of the Month.

After having spent the entire day performing flawlessly during a field standardization evaluation with a missile guidance set change, and while generating targeting information for post maintenance activities, a major water leak occurred in the launch control center plumbing. Recognizing the immediate danger, they attempted to stop the water flow by closing the emergency shut off valves. The valves would not close due to a malfunction in the control air system. The water was still rushing in. Crew R-035 performed emergency shutdown to remove power from the endangered electrical equipment and called for assistance. The water level had reached a depth of two feet and was rising rapidly. The crew was faced with a critical decision. Instead of evacuating, they decided to trace the water line back from the leak to the manual valve controlling the water supply. Water that had already flooded the capsule was draining through the floor and cascading onto the emergency batteries. While caustic and irritating fumes emanated from the battery storage area, the crew used blankets, sheets and towels to form a dam to stem the flow of water around the batteries. Ensuring that the potential for a disasterous explosion had been removed and all procedures had been met, the crew then evacuated. Demonstrating outstanding professionalism and poise under emergency situations, Crew R-035's decisive actions resulted in the elimination of a potentially serious incident.

Munitions Maintenance

SSgt Roy Garner, 96 BMW, Dyess AFB, is SAC's Munitions Airman of the Month.

Currently assigned as a missile electronics equipment technician, SSgt Garner has proven himself to be an invaluable asset to his section and squadron. During the phase-down from the B-52H and transition to the B-1B, he was a key member of the team responsible for the safe and secure shipment of over $300 million in short range attack missile and gravity weapon stockpiles. In addition, he packaged and shipped hundreds of pieces of support equipment, each with their required inspections up to date to ease the burden for gaining organizations. The success of SSgt Garner's efforts helped the 96th BMW receive a certificate of appreciation from the Directorate of Nuclear Surety for outstanding support of prime nuclear airlift force missions and an Air Force Nuclear Safety plaque for a sustained superior safety record in the storage, maintenance and shipping of nuclear weapons.

During B-1B activation, SSgt Garner was responsible for the receipt, inspection, and in-processing of all B-1B missile checkout equipment. He inspected the equipment for serviceability and distributed all equipment requiring calibration to the responsible agencies. This effort involved over 150 pieces of complex electronic equipment used in support of the electronic system test set (ESTS). SSgt Garner's efforts allowed for the timely completion of the calibration and certification of the test stations and helped keep his branch on track toward initial operational capability.

Where Was the Crew . . .?

This article first appeared in Combat Crew in August 1968 under the byline of Capt William G. Halpin, 380 Strat Aerosp Wg correspondent. The author, now a Colonel, currently serves as the SAC Director of Public Affairs.

A KC-135 attempted to liftoff five to nine knots below computed rotation speed in a gusty crosswind.

Another overrotated on takeoff.

Two B-52's collided in-flight while attempting a 360-degree turn in highly congested airspace.

Still another KC-135 flew into the anvil top of a thunderstorm.

Elsewhere a student pilot was permitted to execute the "go" portion of a touch-and-go landing with the stab trim misset.

A copilot flew a KC-135 into the ground during a practice missed approach.

One tanker hit a hill while performing an airborne radar directed approach.

Another KC-135 was flown into a mountain during a published penetration.

In reviewing these and other mishaps, one question keeps coming to mind: Where was the crew?

SAFETY CROSS FEED

Each of these mishaps involved fully qualified crew members and each of them was fatal. The saddest part of all is that each mishap could have been prevented by an alert, informed navigator or other crew member — before it was too late. There is an old axiom that "The pilot is in command of the airplane, but everyone else is in command of his/her own well being," or words to that effect.

Today's crew members are highly professional specialists operating high performance aircraft in every conceivable flight condition. This means that there is no margin for error even though the potential for error remains. Therefore it makes good sense to fly each and every mission as a team. No one on a combat crew can afford the luxury of "quitting for the day" until the aircraft is safely parked on the ramp.

In most SAC aircraft, there are at least two pilots: the aircraft commander and the copilot; and they should have a number of assistants — the number depends on how many others are on the crew. The navigator, for instance, must know a lot more than the science of navigation. The navigator is well equipped to monitor the flight instruments and can measureably aid the boom operator, the gunner or the EWO. The navigator should know when the gear and flap and trim settings are not proper. The navigator must know the proper procedures to follow when communications with air traffic control agencies are lost. He/she should know what terrain problems exist for approaches and departures and must be especially alert for any deviations. To do this, the navigator must be able to read and interpret departure and approach plates. Surely, as a contribution to crew safety, he/she can learn the safe speeds for raising and lowering gear and flaps. The navigator must be considered the key person for knowing safe and effective procedures to detect and avoid severe weather of all types and especially thunderstorms. Understanding that the aircrew, not ATC, is responsible for weather avoidance is crucial. The navigator should be prepared to coordinate with the pilots to prepare a plan and obtain clearance to circumnavigate severe weather. This clearance, however, does not guarantee safe passage through or around the storms.

The navigator and everyone else must know how far they can go today in safely completing a mission. This factor varies from day-to-day just like the mission itself. They must know these things and many more and no one should forget that every individual on the crew is responsible for effective airborne participation in the mission. Yes, the pilot commands, but it is also up to every person on the crew to provide the pilot with effective assistance in determining the proper course of action — in other words, the right decision.

What is this participation? What great effort is required of a crew member to know, note, and advise when the pilot attempts an early rotation or overrotation?

Why didn't anyone recognize the hazards involved in making a 360-degree turn in the midst of heavy mission traffic? Why was everyone silent?

What was the crew doing when the aircraft flew into the anvil head of a severe thunderstorm? They had been flying in the same general area for more than seven hours, and they had an operational radar. What blinded them at the critical moment?

What are the flap and trim settings for touch-and-go landings? I am told that 30 degrees of flaps and 1 to 1½ units of nose-up stab trim works well on the KC-135, and this is a long way from 4 to 5 degrees of nose-up stab trim. It doesn't sound at all like the right setting and it definitely will not work every time.

When an airplane is maneuvering a few hundred feet above the ground, why would a navigator or anyone else be doing anything but monitoring an altimeter — particularly at night?

Why would a crew attempt a practice airborne radar approach in extremely poor weather conditions with no ground radar to monitor progress? In fact, the entire approach was unauthorized. Why didn't they make absolutely certain of altitude restrictions on the final approach? It was simply a case of failure to use the letdown plates.

Was it timidity, lack of confidence, a lackadaisical attitude, or fear of reproachment by the aircraft commander that lulled the navigator into silence while the pilot deviated from published altitudes and hit the mountain? If the navigator had used all of his senses, like his eyes, ears and voice, he might have prevented the accident.

These are certainly jackpot questions and unfortunately we cannot answer them; neither can the only people that could. It is simply a case of someone letting a mishap happen. To keep another from happening for the same reason, we have to recognize a few basic facts. Everyone on a crew has the solemn responsibility to stay alert and speak up loud and clear when any deviation is noted in the aircraft flight path or attitude. But to do this, you have to have a good foundation of knowledge about something other than your own particular specialty. This will take some extra effort on the part of every crew member, but it pays dividends on a colossal scale.

To err is human, but to silently watch others make dangerous errors may very well be fatal. We have to be aware of our own mistakes and the mistakes of others and we must profit, not lose, because of them. *It should never be said in passing,* **"They died in vain."**

"Get Involved"

SAC Tactics School, Nellis AFB

Mission plan, fly, alert, C^2, CEVG's on final, page count for a no-notice pubs check and now someone's asking you to "get involved"? How could you be any more involved than you already are, especially with this thing called "tactics"? What is tactics if it isn't what you're doing now and why does it seem to be getting so much attention?

It would seem if you're going to be asked to get involved, somebody better delete something, or better yet, define the "what it is" one needs to get involved with. This article is an attempt to put some new (or forgotten) thoughts behind what it could mean to be involved.

As a combat ready crew member your responsibility is to be prepared to execute your unit's primary mission **successfully.** It would then make sense that your day to day flight training, threat study, simulator missions and bull sessions are all aimed at ensuring you're ready for this mission. It takes personal initiative and responsibility to research, ask questions and suggest changes to help fill gaps where training is not currently meeting your needs. I've always wondered what it says about a flying organization if we have to force the fliers to talk aviation. In a combat flying unit, the discussion should be hot and heavy on not just keeping the air machine airborne in peacetime, but also how to better employ it in the combat environment. Once a crew member is combat ready, the bomber or tanker becomes only part of the total weapon system used to improve the odds. In other words, you know how to fly the airplane; but remember, the real mission is to employ it in combat, using its every capability and understanding its limitations. Peacetime safety of flight is paramount. But now we're talking combat and the combat ready aircrew should be spending a great deal of time studying the threat, intelligence documents, and tactical doctrine. Sure, it's nice to know how many rings are on the trim button, but our concerns should also be how much time does a Flogger need before he can get a gun tracking solution, what's the firing doctrine of Soviet SAM systems, and what maneuvers could I use to defeat the high tech threat? Get involved with being a combat ready crew member.

SAC TACTICS SCHOOL

IMPROVE THE ODDS

No problem, I'm ready to fly my primary mission and deterrence has worked for 40 years so what are the chances of the "big one?" Look around your squadron for one of the old gray hair types and have them tell you what it was like to be busy "deterring" one day, and the next day have "wheels in the well," headed for a different melee (ARC LIGHT/BULLET SHOT). Our command is committed worldwide to support almost any and every kind of action. If required, regardless of your present primary mission, you can be involved — quickly. There won't be a great deal of time available to start thinking about the capabilities and limitations of a threat which hasn't been bothered by other TRIAD traffic. Get involved beyond what you think your primary mission is and know the threat — cold.

Our brothers in the Tactical Air Forces (TAF) have lived a little closer to the fire (most of the time) and they profess a worldwide capability. Our command has greatly expanded its roles and missions so that while the TAF is still mobilizing, we may already be airborne to support whatever contingency. Our ongoing participation in RED FLAG, MAPLE FLAG and GREEN FLAG exercises can only improve our capability to work with the TAF. It's a two-sided coin and I wouldn't want my first combat coordination problem to be an explanation to the F-15 flight lead how he can best CAP (Combat Air Patrol) my cell of tankers or bombers. What we learn from working together at these exercises may be all we take into combat. Each participating SAC unit has an excellent opportunity to work its staff like a mini-advanced echelon and fine tune their "go to war" mechanism. The tactics team members should fully support and brief each "combat sortie" as to who's the threat, where it is, what kind of support is available and then debrief for lessons learned. Get involved with the excellent opportunities we have and make them count.

Finally, during this whole discussion, no one said anything about removing the real threats of the ORI, CEVG, 60-4 Evals, and the countless other opportunities to excel, in which everyone continues to participate. And no one will! But I'll bet that we'll soon see a change in the types of things that are important during these opportunities that make your **"getting involved"** even more important.

SAC SAFETY SCREEN

96 BMW, Dyess Crew R-112: MP Maj Philip W Burke, MC 1Lt David P Johnson, MN 2Lt Thomas A Scolarici, MB SSgt Raymond C Frey

96 BMW, Dyess Crew R-113: MP Capt Roger D Walski, MC 1LT James J Newell, MN 1Lt Julia M Latham, MB TSgt Glenn W Faught

96 BMW, Dyess Crew E-131: IP Capt Peter F Szabo, MC 1Lt James G Fish, MN 1Lt Mark A Clark, IB SSgt Merri S Keister

96 BMW, Dyess Crew R-135: MP Capt Randall L Cole, MC Capt Rainor P Stackowitz, IN Capt Karen L Schell, IB SSgt Terry M Sanders

310 AREFS, Plattsburgh Crew R-181: P Capt Michael D Davitte, CP 1Lt Michael E Clark, N Capt Duane J Acito, BO Sgt Joseph A Lambertus

310 AREFS, Plattsburgh Crew R-172: P Capt Karen E Love, CP 1Lt Richard J Doperiala, N Capt Richard E Smith, BO Sgt Colon K Miller

310 AREFS, Plattsburgh Crew E-184: P Capt Paul F Kidzus, CP 1Lt Gerald Katz, N 1Lt Stephen Visco, BO SSgt John B Crawford

380 AREFS, Plattsburgh Crew S-130: P Capt Mark E Carlton, CP 2Lt John P Almind, N 1Lt Robert J Jones, BO SrA William M Peterson

99 AREFS, Robins Crew E-182: IP Capt Richard C Hart, CP 1Lt Jack W Taylor, NN 1Lt Thomas A Scott, BO Sgt Tony L Rhoden

912 AREFS, Robins Crew R-120: IP Capt Keith J Kuhlmann, CP 1Lt Kyle J Smith, NN 1Lt Michael J Barrett III, BO SSgt Kevin J Metz

68 AREFG, Seymour Johnson Crew S-005: AC Maj Gary D Garland, CP Capt Robin L Sanders, FE SMSgt Dale F Richardson, BO SMSgt Thomas E Glenister

97 AREFS, Blytheville Crew E-105: AC Maj Jeffrey C Seymour, CP 1Lt Denis S James, N Capt Joseph W Sabatino, BO TSgt Cleveland Filmore

97 AREFS, Blytheville Crew E-111: AC Capt Scott A Shaw, CP Capt Gary L Konigsmark, N 1Lt Kevin L Whitman, BO SrA Lori T Wood

350 AREFS, Beale Crew E-161: AC Capt Steven A Delaney, CP 1Lt Andrew E Sizemore, N 1Lt Richard E Polachek, BO Sgt John E Anderson

349 AREFS, Beale Crew E-145: AC Capt Johnny C Johnston, CP Capt John Smarsh Jr, N Capt Elvis Medina, BO Sgt John J Donohue

91 SMW, Minot Crew E-074: MCCC 1Lt Michael R Runels, DMCCC 2Lt Brian L Crawford

341 SMW, Malmstrom Crew R-143: MCCC 1Lt Kirk H Pridell, DMCCC 2Lt Kenneth W Forrester

44 SMW, Ellsworth Crew E-070: MCCC Capt Scott Markle, DMCCC 2Lt Donnie Chappell

321 SMW, Grand Forks Crew S-033: MCCC 1Lt Davis W Lannom Jr, DMCCC 2Lt John A Hurtado

308 SMW, Little Rock Crew R-154: MCCC 1Lt Gary S Lukach, DMCCC 1Lt Gerald M Braswell, MSAT SrA Michael C Pearson, MFT SrA Steven R Clayton

381 SMW, McConnell Crew E-093: MCCC Capt Charlie J Thomas, DMCCC Capt Sarah J McNany, MSAT Sgt Jose D Rosaio Jr, MFT A1C Michael O Kinslow

41 AREFS, Griffiss Crew S-102: P Capt Timothy W Hurst, CP 1Lt Fred Mosher, N Capt Gerry Conway, BO SSgt Stephen Roche

41 AREFS, Griffiss Crew R-106: P Maj Robert Phillips, CP 1Lt Charles Picardy, N 1Lt Brad Lockhart, BO Sgt Scott Hicking

668 BMS, Griffiss Crew S-02: P Capt Donald L Carlson, CP 1Lt Gary A Vrabel, RN Maj Michael A Quigley, N 1Lt Douglas C Forbes, EWO Capt Gregg B Bourke, G SSgt Samuel F Kovacic

17 RW, RAF Alconbury, Crew E-31 and Crew R-34: P Maj Don Merritt, P Capt Steve Nichols

42 AREFS, Loring Crew E-124: IP Lt Col Michael A Frazier, CP 1Lt Michael S DeJonge, IN 1Lt Kenneth J Breuer, NN Capt Arthur E Kisby, BO A1C Matthew J Karnauskas

69 BMS, Loring Crew E-12: P Capt Martin S Hausen, CP 1Lt Gerald R Grant, RN Capt Christopher M Ziajka, NN 1Lt Rory Adams, EW 1Lt Ronald Ricchi, MG TSgt David White

407 AREFS, Loring Crew R-184: P Capt Robert Bixler, CP 1Lt William Bender, NN 2Lt Nicole Desilets, BO SSgt William Browning

46 AREFS, K I Sawyer Crew R-132: P Capt Darc J Kramer, CP 1Lt Essa C Dabbikeh, N 1Lt Jeff Cassens, BO SSgt Curt J. Ulmstead

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1.*

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FLARE

Citizenship—My Rights and Responsibilities

To be an American . . . think about it for a moment. To be a citizen of the greatest country that has ever existed on the face of the earth . . . to be part of a nation with a legacy second to none, where the dreams and hopes of democracy and freedom have been successfully put to the test . . . to live in a society admired the world over despite its obvious imperfection. America. A Rugged Yet Beautiful Land Of Rolling Hills, Seemingly Endless Plains, Lush Virgin Forests, And Towering Mountain Peaks That Rise Majestically Into The Heavens.

All American citizens have inherited this splendor, a free and gracious gift to those of us fortunate enough to have been born in these United States or who have become naturalized citizens. The rights guaranteed by the Constitution are ours by virtue of our birthright. The freedom to worship God as we perceive him, to assemble and peaceably protest, or to voice our opinions if we feel like it. We Americans too often take these simple things for granted. We fail to observe what happens to the citizens of Moscow, Havana, or Tehran when they try to exercise their rights. Too often, we forget what is required of us as American citizens to ensure that our way of life is preserved for our children and grandchildren. Small, insignificant actions, such as a trip to the voting booth on election day and casting a ballot for the candidate of our choice. Or enlisting in the Armed Forces and serving a couple of years in defense of democracy, a small token considering the price that has already been paid for our freedom. Or how about the respect for the flag at the ballpark or local Scout meeting? These trivial items we so often overlook are the trademarks of an American who loves his country. The unabashed pride and lump in the throat as you watch Old Glory being raised during the Olympics. How often do we sing the immortal words of Frances Scott Key without feeling or emotion?

Let us never lose sight of who we are or what we are. May we never become so complacent, snug, and isolated to events around us that we forget our responsibilities as citizens of this great republic. For to do so as a nation would surely place the future of our country in jeopardy. We cannot ignore the lessons of history concerning the many great civilizations and societies that have collapsed because of internal decay and apathy. Our greatest threat is not necessarily the Soviet Union and Communism, or even the cessation of the flow of oil from the Middle East; the most dangerous obstacle to our future as Americans is the shirking and neglect of our responsibilities as citizens of the United States. Don't ever forget it, and please, don't let your children forget it, either.